Complete Summary

GUIDELINE TITLE

Suctioning of the patient in the home.

BIBLIOGRAPHIC SOURCE(S)

American Association for Respiratory Care (AARC). Suctioning of the patient in the home. Respir Care 1999 Jan;44(1):99-104. [29 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Pulmonary disease

GUIDELINE CATEGORY

Evaluation
Rehabilitation
Treatment

CLINICAL SPECIALTY

Pulmonary Medicine

INTENDED USERS

Respiratory Care Practitioners

GUIDELINE OBJECTIVE(S)

- To improve the consistency and appropriateness of respiratory care and serve as a guide for education and research.
- To provide clinical practice guidelines on suctioning of the patient in the home

TARGET POPULATION

Patients, with or without an artificial airway, cared for in the home who require suctioning to clear the airway

INTERVENTIONS AND PRACTICES CONSIDERED

Nasal, oropharyngeal, and endotracheal suctioning

MAJOR OUTCOMES CONSIDERED

- Removal of secretions;
- Improvement in breath sounds;
- Decreased peak inspiratory pressure during volume-cycled mechanical ventilation;
- Increased tidal volume delivery during pressure-cycled mechanical ventilation;
- clearing of cough;
- Improvement in oxyhemoglobin saturation as reflected by pulse oximetry;
- Subjective improvement as reported by patient;
- A decrease in respiratory and heart rate and decreased shortness of breath.

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Consultants to the Working Group may review the initial draft of the guideline. After completion by the Working group, the draft is reviewed by the entire Steering Committee and then by a Review Panel, persons engaged in all facets of the delivery of respiratory care who have volunteered to review drafts of the Guidelines before publication.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Description
Suctioning is a component of bronchial hygiene that involves the mechanical aspiration of secretions from the nasopharynx, oropharynx, and trachea. The airway may be in its natural state or artificial (as with a tracheostomy) or surgically altered (as with a laryngectomy). The patient may or may not be receiving mechanical ventilation. The procedure includes patient preparation, the actual suctioning event, and follow-up care and observation of the patient.

- Patient preparation.
    1. Whenever possible, the patient should be encouraged to clear the airway by directed cough or other airway clearance techniques.
    2. Whenever possible, the patient should be taught to perform this procedure for himself.
    3. Preoxygenation or hyperinflation prior to the suctioning event may not be routinely indicated for all patients cared for in the home. Whenever

possible the patient's response to suctioning during his stay in the acute care or long-term care facility should be made a part of the discharge summary, and the health care professional establishing the patient in the home should request this information.

Experience with neuromuscular patients suggests that hyperinflation when the vital capacity of such patients is < 1.5L makes tracheal suctioning unnecessary. Other patients for whom preoxygenation or hyperinflation may not be necessary or advisable include those

- requiring only nasal or oropharyngeal suctioning;
- without an endotracheal airway, whose vital capacity and muscle strength are adequate to produce an effective cough;
- whose ventilatory drive has been demonstrated to stem from hypoxia;
- with a demonstrated tolerance for the procedure with no adverse reactions.

4. Preoxygenation and/or hyperinflation may be indicated in:
    - pediatric patients with decreased respiratory reserve;
    - patients who have been documented to experience oxygen desaturation during the suctioning event as evidenced by pulse oximetry;
    - patients who exhibit cardiac dysrhythmias during the suctioning event;
    - patients who are receiving continuous supplemental oxygen.
5. When preoxygenation and/or hyperinflation are indicated, it is recommended that this be done manually using a resuscitation bag with supplemental oxygen, as appropriate. All caregivers should receive thorough instruction in the use of resuscitation bags and manual hyperventilation techniques; improper or imprecise use of resuscitation bags for hyperinflation can cause lung injury and respiratory alkalosis. If hyperoxygenation or hyperventilation are not required, tidal volume may be conserved by passing the suction catheter through the port cap on the swivel adapter of the ventilator circuit.
6. Normal saline solution should not be instilled routinely but only when specifically medically indicated (for example, to stimulate cough).

- The suctioning event: Actual introduction of the suction device (catheter or oral suction tip) into the naso- or oropharynx, or into the trachea via the laryngostoma or artificial airway should be in accordance with existing Clinical Practice Guidelines.
    1. It is common and accepted practice to use 'clean' rather than sterile technique during suctioning in the home environment, although scientific evidence to support or discount either technique in home care is lacking.
    2. Clean (non-sterile) gloves should be used when endotracheal suctioning is performed. Gloves reduce the risk of introduction of inoculant to the patient's airway, the risk of cutaneous infection in the caregiver, and transmission of organisms to others. Gloves may not be necessary when oropharyngeal suctioning is performed.
    3. At the conclusion of the suctioning event, the catheter or tonsil tip should be flushed by suctioning recently boiled or distilled water to

rinse away mucus, followed by the suctioning of air through the device to dry the internal surface and, thus, discourage microbial growth. The outer surface of the device may be wiped with alcohol or hydrogen peroxide. The suction catheter or tonsil tip should be allowed to air dry and then be stored in a clean, dry area.

4. Suction catheters treated in the manner described may be reused. We recommend that the catheters be discarded after 24 hours although no evidence for or against this can be found. Tonsil tips may be cleaned, boiled, and reused indefinitely. If it is feasible to clean the suction device and subject it to high level disinfection, it may be reused until its integrity is lost. The importance of mechanical cleaning cannot be overemphasized (ie, removal of mucus and other organic material).

- Follow-up care: Following the suctioning event
    1. the patient should be monitored for adverse reactions;
    2. the patient in whom pre-procedure hyperoxygenation and/or hyperinflation was indicated should be treated by the same method(s) post-procedure.

Setting

This guideline applies only to the home care setting. Alternate care sites such as subacute, rehabilitation, or skilled nursing facilities should use Guidelines for suctioning in the acute care setting.

Indications

The primary indication for suctioning the patient cared for at home is the patient's inability to adequately clear the airway by cough. The need for airway clearance is evidenced by:

- more frequent or congested-sounding cough;
- coarse rhonchi and expiratory wheezing audible to the patient and/or caregiver with or without auscultation;
- visible secretions;
- increased peak pressures during volume-cycled mechanical ventilation;
- decreased tidal volumes during pressure-cycled ventilation;
- indication by the patient that suctioning is necessary;
- suspected aspiration of gastric or upper airway secretions;
- otherwise unexplained increase in shortness of breath, respiratory rate, or heart rate;
- decreases in vital capacity and/or oxygen saturation (as indicated by pulse oximetry), thought to be related to mucus plugging.

Contraindications

When suctioning is indicated, no absolute contraindications exist and failure to suction can prove to be more detrimental than potential adverse reactions. Routine or 'scheduled' suctioning, with no indication of need is not recommended.

Limitations of procedure

Endotracheal suctioning is not a benign procedure, and the caregiver should remain sensitive to possible hazards and complications, taking all necessary precautions to ensure patient safety. Secretions in the peripheral airways cannot be removed by suctioning. Optimal humidification of inspired gases and

appropriate systemic hydration is important to the maintenance of airway integrity.

Assessment of Need

The patient should be periodically assessed by the caregiver to determine the need for suctioning when the need does not obviously present itself. For patients on long-term mechanical ventilation, this assessment should be included in the patient/ventilator system check.

Assessment of Outcome

Results and observations related to suctioning should be recorded to inform and alert other caregivers. The suctioning procedure can be considered successful and the need for suctioning affirmed by one or more of the following:

- removal of secretions;
- improvement in breath sounds;
- decreased peak inspiratory pressure during volume-cycled mechanical ventilation;
- increased tidal volume delivery during pressure-cycled mechanical ventilation;
- clearing of cough;
- improvement in oxyhemoglobin saturation as reflected by pulse oximetry;
- subjective improvement as reported by patient;
- a decrease in respiratory and heart rate and decreased shortness of breath.

Resources

- Equipment: Equipment and supplies to used for suctioning the home care patient may include:
    1. electrically powered aspirator with a calibrated, adjustable regulator and collection bottle with overflow protection. A battery-powered aspirator may be needed for the patient who leaves the home or lives in an environment subject to frequent power failures;
    2. suction catheters, sized appropriately. Open suction systems are used most frequently. (The use of closed systems has not been demonstrated to be medically indicated in the patient who is not immunosuppressed);
    3. tap water that has been boiled, stored in a closed, clean container, and used within 24 hours of boiling to flush the catheter. (Water directly from the tap should not be used because of the possibility of contamination.)
    4. clean or sterile gloves as indicated; barrier protection when active infection is present or suspected;
    5. manual resuscitator when hyperinflation is medically indicated;
    6. oxygen source when preoxygenation is medically indicated;
    7. sterile normal saline for instillation when medically indicated;
    8. oral suction device (eg, tonsil tip);
    9. sterile distilled and/or recently boiled water and cleaning solution.
- Personnel: As stated previously, the patient should be trained in self-care whenever possible. In the event that the patient is unable to perform the procedure, the bedside caregivers (family members, personal care attendants, other designated care givers) should be thoroughly trained and

demonstrate their ability to perform the procedure and clean and care for equipment.

1. Only credentialed or licensed professional staff with documented specialized training and experience in airway management procedures and patient assessment should be specified as trainers (eg, licensed and credentialed respiratory care practitioners and registered nurses). These trainers should also observe, on a regular basis, performance of the procedure by the patient and caregivers to determine the need for reinforcement and remediation.
2. All caregivers should demonstrate a good understanding of the procedure and the ability to perform the procedure competently, including:
    - knowledge of proper use and assembly of all necessary equipment and supplies;
    - ability to recognize that suctioning is indicated;
    - ability to assess effectiveness of the procedure;
    - ability to monitor vital signs, assess the patient's condition, and appropriately respond to complications or adverse reactions;
    - ability to perform the procedure with the least amount of risk of introducing inoculant into the patient's airway;
    - knowledge of infection control procedures and demonstrated ability to effectively wash hands and clean, disinfect, and properly store equipment and supplies.

Monitoring

The patient should be monitored to ascertain effectiveness of the procedure and to detect any adverse reaction. Variables to be monitored include:

- breath sounds,
- skin color--including the presence or absence of cyanosis,
- respiratory rate and characteristics,
- heart rate,
- sputum characteristics (color, volume, consistency, odor)
- blood pressure,
- ventilator variables (including tidal volume, peak inspiratory pressure, respiratory rate, expiratory pressure),
- oxygen saturation by pulse oximetry when medically indicated.

Frequency

The suctioning procedure should be undertaken only when indications are clearly present (Sections on Indications, Contraindications and Assessment of Need).

Infection Control

All caregivers should practice infection control procedures appropriate to the home environment. To the extent feasible, patients should be protected from visitors and caregivers with active viral and bacterial infections that are airborne or spread by direct contact.

Immunizations recommended by the Centers for Disease Control and Prevention should be current in both caregivers and patient. When HIV and/or hepatitis or other bloodborne infection are known to be present or when the patient's status is

unknown and when infection with organisms spread by droplet infection is known or suspected, specific precautions should be instituted.

With all patients the steps undertaken are

- proper handwashing before and after performing the procedure;
- clean or sterile suctioning technique as indicated;
- cleaning and disinfection of all equipment and supplies beginning with thorough mechanical cleaning with detergent and water and followed by one of the following
    1. a 60-minute soak in a solution of vinegar and water with an acetic acid content > or = 1.25% (The vinegar solution should not be reused.);
    2. quaternary ammonium compound (prepared and reused according to manufacturer's instructions);
    3. glutaraldehyde;
    4. boiling when equipment withstands such procedures;
- proper storage of equipment and supplies between use;
- proper disposal of spent supplies and infectious waste.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Not specifically stated for each recommendation: The guideline is developed from a thorough review of the literature, surveys of current practice, and the expertise of the members of the working group.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Effective suctioning of the patient in the home
- Improved bronchial hygiene

POTENTIAL HARMS

Because the suctioning event is inherently the same in the home as in the critical care setting, the possible hazards and complications are the same. Dislodgement and introduction into the lower airway of bacteria colonizing the tracheal tube has been demonstrated. Further, the bacterial count introduced may be increased when saline is instilled. The home care patient is not monitored by any except the most basic methods, and the patient must be closely observed for all of the following:

- oxygen desaturation as indicated by pulse oximetry if such monitoring has been prescribed;

- trauma to the oral, tracheal, or bronchial mucosa;
- cardiac arrest;
- respiratory arrest;
- cardiac dysrhythmias;
- pulmonary atelectasis;
- bronchospasm or bronchoconstriction;
- airway infection;
- bleeding or hemorrhage from the airway;
- hypertension;
- hypotension.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

American Association for Respiratory Care (AARC). Suctioning of the patient in the home. Respir Care 1999 Jan;44(1):99-104. [29 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1999 Jan

GUIDELINE DEVELOPER(S)

American Association for Respiratory Care - Professional Association

SOURCE(S) OF FUNDING

American Association for Respiratory Care (AARC)

GUIDELINE COMMITTEE

Respiratory Home Care Working Group

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Names of Working Group Members: Susan L. McInturff, RRT, RCP, Chairman; Barry J. Make MD; Peggi Robart MA, RRT, RCP; Allan B. Saposnick MS, RRT.

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

According to the guideline developer, this version has been reviewed within the last five years and is considered current.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available from the American Association for Respiratory Care (AARC) Web site.

Print copies: Available from AARC, CPG Desk, 11030 Ables Ln, Dallas, TX 75229-4593.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- The AARC Clinical Practice Guidelines. Respir Care 1996;41(7):647-53.

Print copies: Available from the American Association for Respiratory Care (AARC), CPG Desk, 11030 Ables Ln, Dallas, TX 75229-4593; Web site: www.aarc.org.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on April 25, 1999. The information was verified by the guideline developer on April 25, 1999.

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